

REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of June 15, 2004, relating to the above-identified application.

In order to more particularly point out and distinctly claim applicants' contribution to the art and to expedite prosecution, the subject matter of original Claims 2 and 6 have been incorporated into Claim 1, as currently amended.

The rejection of Claims 1 and 3, under 35 U.S.C. § 102(e), as anticipated by *Renault* (US 6,435,577), *Sato* (US 6,428,065 or US 6,676,179), *Iwamoto* (US 6,540,275) or *Fuji* (JP 2002-274298), is traversed and reconsideration is respectfully requested.

The rejection of Claim 4 under 35 U.S.C. § 102(e), as anticipated by either *Renault* or *Sato*, identified above, is also traversed and reconsideration is respectfully requested.

The rejection of Claim 5 under 35 U.S.C. § 102(e), as anticipated by either *Iwamoto* or *Renault*, both identified above, is also traversed and reconsideration is respectfully requested.

Since the issues regarding each of these three separate rejections are closely interrelated, they will be discussed together. The present invention is directed to a bumper structure on a vehicle which is attached to the front part of the vehicle body extending in a width-wide direction of the vehicle and more particularly to a bumper structure which effectively protects a pedestrian when a vehicle with such a bumper structure accidentally collides with a pedestrian. The bumper structure of the present invention is especially designed to protect a pedestrian from severe injury during an accidental impact, especially to the area of the knee. This is accomplished by appropriately selecting the ratio of crush strokes of the upper and lower bumper parts when the vehicle accidentally contacts the pedestrian. During a low speed collision, the

upper bumper part contacts an area near the knee of the pedestrian and the lower bumper part of the bumper contacts a lower part of the pedestrian's leg. The upper shock absorber of the bumper upper part is designed to have a larger crush stroke than the lower shock absorber of the lower bumper part. Therefore, the lower bumper pushes the lower part of the pedestrian's leg forwardly and applies an upwardly moving force on the leg of the pedestrian. The upper bumper part is designed to move the area around the knee relatively backward since the crush stroke of the upper shock absorber is larger than that of the lower shock absorber. By the application of a rotational force to the entire leg, the impact load applied to the knee is decreased. Because the ratio of the crush strokes is set at a predetermined value, a bending angle formed by a leg part below the knee and the leg part above the knee can be maintained in an appropriate range and thereby decrease the injury to the knee area. This is particularly shown in Figure 8 of the application, which is a graph showing the bending angle, θ , of the knee area when the ratio of the crush strokes is less than 1.5. In Figures 6 and 7, the bending angle of the knee is less than 15° when the ratio of crush strokes of the upper shock absorber 12 to the lower shock absorber 22 is in the range of 1.5 to 2. In this range, the damage to the knee can be decreased.

However, a comparison of Figures 6 and 8 shows the difference when the crush strength difference in the ratio of crush strokes of the upper shock absorber 12 to the lower shock absorber 22 is less than 1.5, the bending angle θ of the knee is over 15° which exceeds the legally determined value. When the bending angle of the knee is increased, greater damage to the pedestrian results.

Applicants wish to point out that the two patents of *Sato*, cited above, are both assigned to Fuji Jukogyo, the same assignee as the present application, and Kenichi Sato, is the inventor

of the two cited *Sato* patents, as well as one of the inventors of the present application. Accordingly, these two references are excluded by 35 U.S.C. § 103(c) as references for a 35 U.S.C. § 102(e) rejection.

35 U.S.C. § 103(c) provides “...subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of Section 102 of this title, shall not preclude patentability under this section where the subject matter of the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.”

With regard to the Japanese reference, P 2002-274298A, which has an application date of March 15, 2001 and a publication date of September 25, 2002, this Japanese reference is also assigned to Fuji Jukogyo, same assignee as the present application and, therefore, is excluded by 35 U.S.C. § 103(c).

Claim 1 now specifies that the crush stroke is 1.5 and that the upper shock absorber is spaced apart from the lower shock absorber at a distance in the range of about 160 mm to about 240 mm. At a ratio of crush strokes of 1.5, this smallest value of the bending angle at the knee provides the greatest protection for the pedestrian. In the present application, the ratio of the crush strokes is obtained by using expanded polypropylene with different expansion ratios for upper and lower shock absorbers. The present application, on pg. 9, lines 3-6, describes that the expansion ratio of the upper shock absorber can be determined to be 1.5 to 3 times that of the lower shock absorber 22 for controlling the ratio of the crush strokes.

In the *Renault* reference, the bending angle of 15° or less at the knee can be obtained by using a low absorber that is more rigid than the upper absorber; see col. 4, lines 44-50. The

reference describes that the top absorber 10 preferably has a density of 40 g/l to 60 g/l and the bottom absorber 32 preferably has a density of 80 g/l to 100 g/l.

The polypropylene for the absorbers in the *Renault* reference may be the same or similar as that in the present invention; it is not apparent from the reference. However, there is no description in *Renault* of the crushing ratio of 1.5. Moreover, the *Renault* reference fails to appreciate that a particularly beneficial result is obtained with the expansion ratio of 1.5.

No study is made in the *Renault* patent as to the relationship between the density of the absorbers and the bending angle of the knee and there is no suggestion how to select the most effective density or what is the most effective density in the *Renault* patent. Thus, the bumper structure with a crushing ratio of 1.5 is not described in the *Renault* patent within the meaning of 35 U.S.C. § 102(e).

The *Iwamoto* reference describes a structure which is designed to provide enhanced safety to a pedestrian. In the bumper structure of *Iwamoto*, the energy-absorbing member 8 is the upper absorber and has a rigidity greater than the projecting part 12 of the lower absorber. However, *Iwamoto* fails to numerically disclose the ratio of crushing strokes and fails to disclose the relationship between the crushing strokes of the absorbers and the bending angle of the knee. Consequently, applicants respectfully submit that the selection of the crushing ratio of 1.5 is not described by the *Iwamoto* patent within the meaning of 35 U.S.C. § 102(e).

It should also be noted that amended Claim 1 includes the feature adding the distance between the upper shock absorber and the lower shock absorber in the range of about 160 mm to about 240 mm. When a pedestrian is struck against the bumper with such structure, the bending angle of the knee is smaller in comparison to a bumper wherein the distance between the upper

and lower absorber is greater than the claimed range. Accordingly, in summary, Claim 1 defines the bumper structure to more particularly distinguish the present invention from what is shown in the prior art. Since the prior art does not describe the subject matter of the claimed invention, as defined in Claim 1, the rejections of Claims 1, 3, 4 and 5 under 35 U.S.C. § 102(e) should be withdrawn.

The rejection of Claims 2, 6, 7 and 8 under 35 U.S.C. § 103(a), as unpatentable over any one of *Renault*, *Sato*, *Iwamoto*, or *Fuji* is traversed and reconsideration is respectfully requested. The *Sato* and *Fuji* references have been disqualified under 35 U.S.C. § 103(c).

This leaves for consideration the *Iwamoto* and *Renault* patents which have been discussed above. There is completely lacking in these two references any suggestion that by choosing the crushing ratio of 1.5 unexpectedly good results are obtained insofar as minimizing the bending angle around the knee area in the leg of a pedestrian that is accidentally hit with a vehicle at a low speed collision. There are simply no guidelines in these references which would direct a person skilled in the art to select a particular crushing ratio of 1.5. Accordingly, applicants respectfully submit there is no motivation, reason or suggestion in the references whereby a person skilled in the art would arrive at the claimed invention.

For the reasons set forth above, applicants respectfully submit that the rejection fails to make a case of *prima facie* obviousness and, therefore, the rejection should be withdrawn.

With regard to the comment in the Official Action that the Information Disclosure Statement filed on July 24, 2003, fails to comply with 37 C.F.R. § 1.98(a)(2), applicants point out that a copy of the Japanese document translation and a copy of the U.S. published application 2001/0026073 A1 were furnished as established by applicants' postcard receipt and


acknowledged by the PTO. Consequently, applicants request the Examiner to clarify the statement in the Official Action since the official record shows that the Information Disclosure Statement filed July 24, 2003 was complete. A copy of applicants' postcard receipt showing the PTO date stamp, which acknowledges and establishes that the references were in fact filed, is enclosed herewith.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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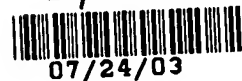
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Please stamp with the date of receipt & return to addressee.

Applicants: SUGANUMA, Hiroshi et al.
Appl. No.: To Be Assigned
Filing Date: Concurrent Herewith
Title: Bumper Structure for Vehicle

17410 U.S. PTO

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07/24/03

- Papers Submitted:
1. \$790.00 Check;
 2. Utility Patent Application Transmittal (1 page);
 3. Fee Transmittal for FY 2003 (1 page);
 4. Specification (13 pages), Claims (2 pages), Abstract (1 page), and Drawings (8 sheets, depicting Figs. 1-12);
 5. Declaration/Power of Attorney (1 page);
 6. Recordation Form Cover Sheet and Assignment (3 pages);
 7. Information Disclosure Statement and Form PTO/SB/08A with 2 cited references (9 pages);
 8. Claim for Foreign Priority and Certified Copy of Japanese Application No. 2002-216882 (23 pages);
 9. Certificate of Mailing Under 37 C.F.R. §1.10 (1 page); and
 10. Return Receipt Postcard.

Sender:

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RGW/lk

July 24, 2003 (Express Mail Label No. EV327360310US)

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